

Advanced Age: Is It an Indication or Contraindication for Laparoscopic Ventral Hernia Repair?

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ABSTRACT

Introduction: Ventral hernias are common surgical problems in the geriatric population. Although ventral hernias are electively repaired in younger patients, the safety and efficacy of elective laparoscopic hernia repair in the geriatric age group is not well documented in the literature.

Methods: A review of 155 patients undergoing laparoscopic ventral hernia repair was undertaken. The patients were classified according to their age into 2 groups, Group A (n=126) for those who are ≤ 65 years old and Group B (n=29) for those who are >65 years old. The patient demographics, comorbidities, hernia characteristics, and operative and postoperative data were compared.

Results: Younger patients were found to have a significantly increased BMI, while the older group had an increased number of comorbidities. No difference was found in the complication or recurrence rates between the 2 groups.

Conclusion: Elective laparoscopic ventral hernia repair in senior citizens is safe and feasible in our experience. We believe that the decision to perform an elective hernia repair in this patient population should be based on the general condition of the patient rather than the patient's chronological age.

Key Words: Age, Laparoscopy, Ventral, Hernia.

INTRODUCTION

In the United States, 4 to 5 million patients undergo abdominal operations each year.¹ Incisional hernias complicate 2% to 20% of these procedures.²⁻⁴ In addition, 5% of the general population has an umbilical or epigastric hernia,⁵ making ventral hernia repair one of the most commonly performed surgical procedures. Approximately 90 000 ventral hernias are repaired annually.⁶

The geriatric population experiences an even higher incidence of ventral hernias. This is attributed to a variety of reasons, including the loss of muscle strength in the anterior abdominal wall, and the prevalence of comorbidities that lead to increased intraabdominal pressure.⁷ In addition, advanced medical care has increased life expectancy in industrialized countries. By 2025, 25% of the United States population is estimated to be over the age of 65.⁸ Senior citizens now lead more active life styles.⁹ Thus, ventral hernias in the geriatric age group are an increasingly important problem. While the presence of a ventral hernia in a young adult is considered an indication for repair,⁵ there may be some concerns about the safety of elective ventral hernia repair in the elderly population.

Laparoscopic ventral hernia repair has proven to be a safer and more effective procedure than open ventral hernia repair.^{4,10,11} Whereas laparoscopic procedures were once avoided in the geriatric population, they are now considered a safe approach to manage the surgical needs of this growing population.⁹

The goal of this communication is to evaluate the safety and efficacy of laparoscopic ventral hernia repair in patients who exceed 65 years of age.

METHODS

The study retrospectively compared 155 patients of all ages who choose to undergo elective laparoscopic ventral hernia repair between July 2001 and July 2006 at Michigan State University/Kalamazoo Center for Medical Studies. Patients were classified according to their age into 2 groups, group A consisted of patients ≤ 65 years old. Group B included those >65 years old.

Medical comorbidities and the general medical condition

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of all patients were evaluated and optimized before surgery. Patients with pulmonary or cardiac comorbidities had a pneumoperitoneum established to the pressure of 12 mm Hg instead the standard of 15 mm Hg.

All repair procedures were performed by a single surgeon (the first author) using the same operative technique and perioperative protocols. All patients received sequential compression devices and preoperative antibiotics.

A baseline comparison was made between the 2 groups for patient demographics (including weight, height, and body mass index), American Society of Anesthesia score (ASA), medial comorbidities, types of hernia, operative time, and the length of hospital stay. Furthermore, postoperative complications were compared.

Statistical Analysis

Descriptive statistics were computed for all variables. To assess the difference between the 2 age groups of hernia patients, the *t* test was computed for the quantitative variables while the chi-square test and Fisher's exact test were used for categorical variables. All statistical analyses were done using SAS Version 9.1 (Cary, NC) at 5% level of significance.

RESULTS

Both groups were similar regarding sex distribution. Weight and body mass index were significantly higher in the younger age group (group A). There was no difference in the American Society of Anesthesia (ASA) score between the 2 groups (**Table 1**).

The older age group had an increased number of previous hernia repairs (mean number of previous repairs, 0.72 vs. 0.61). Lysis of the resultant adhesions may explain the increase in the operative time (mean OR time, 125 minutes

vs. 97 minutes). Another reason for the longer operative time in older patients is the relatively small working space created by the lower pneumoperitoneum pressure used in patients with cardiac problems (which is more common among older patients). There was no significant difference in the length of stay between the 2 groups (**Table 2**).

No significant difference was noted between the 2 groups regarding the number of hernia defects, size of the defects, or the surface area of the mesh required to close the defects. Incisional hernia was the most common type of hernia between the 2 groups followed by umbilical hernia; however, the prevalence of incisional hernia was significantly higher in the older age group, which can be explained by the longer past history of medical disease (lead time effect) (**Table 2**).

Associated comorbidities were significantly more prevalent in the older age group, with hypertension being the most common (79% in group B vs. 31% in group A), followed by cardiac problems (42% in group B vs. 6% in group A). On the other hand, obesity (BMI > 30) was more prevalent among younger patients (37% in group A vs. 21% in group B). Other comorbidities included pulmonary diseases, diabetes, hypothyroidism, and the presence of other hernias (inguinal, hiatal, and others). These comorbidities were more or less equally distributed between the 2 groups (**Table 3**).

The complication rate was similar between the 2 groups (**Table 4**). All procedures were completed laparoscopically except for those in 4 patients (3 in group A and 1 in group B) due to extensive adhesions. No deaths and no cases of bowel injury occurred. The postoperative course was unremarkable except in 6 patients (all of them are from the younger age group) who developed a prolonged ileus secondary to extensive adhesiolysis. In addition, one patient in the older group developed a postoperative

Table 1.
Patient Characteristics

Variable	Group A ≤65 (N = 126)	Group B >65 (N = 29)	Total (N = 155)	P Value
Gender (F/M)	73/53	22/7	95/60	0.0740*
Height (meter)	1.7 ± 0.1	1.6 ± 0.1	1.7 ± 0.1	0.0537*
Weight (kg)	96.4 ± 30.8	78.3 ± 16.5	93 ± 29.5	<0.0001
BMI	33.7 ± 10.2	28.9 ± 6.2	32.8 ± 9.7	0.0023
ASA	2.1 ± 0.8	2.1 ± 0.8	2.1 ± 0.8	0.7499*

*Not statistically significant.

Table 2.
Hernia Characteristics, Operative Time, and Length of Stay

Types	Group A ≤65 (N = 126)	Group B >65 (N = 29)	Total (N = 155)	P Value
Previous Hernia Repairs	0.6 ± 1.2	0.7 ± 1.1	0.6 ± 1.2	0.6462*
Fascial Defects	2 ± 1.3	2.7 ± 2	2.1 ± 1.5	0.0770*
Size of Defects (cm ²)	21.8 ± 41.8	20.1 ± 18.7	21.5 ± 38.6	0.7372*
Size of Mesh (cm ²)	158.4 ± 90.4	174.6 ± 85.8	161.5 ± 89.5	0.3814*
Type of Hernia				0.0445
Incisional (%)	69 (54.8)	19 (65.5)	88 (56.8)	
Umbilical (%)	40 (31.7)	3 (10.3)	43 (27.7)	
Epigastric (%)	9 (7.1)	3 (10.3)	12 (7.7)	
Spigelian (%)	7 (5.6)	2 (7)	9 (5.8)	
Parastomal (%)	1 (0.8)	2 (7)	3 (1.9)	
OR Time (minutes)	97.4 ± 44.5	126 ± 70.8	102.6 ± 51.2	0.0490
Length of Stay (Days)	1.7 ± 2	2.1 ± 1.5	1.8 ± 1.9	0.3905*

*Not statistically significant.

Table 3.
Comorbidities in Both Age Groups

Comorbidities	≤65 Years Old	>65 Years Old	P Value
Hypertension (%)	40 (31)	22 (79.3)	<0.0001
Cardiac (%)	9 (6.4)	11 (41.4)	<0.0001
Obesity (BMI ≥ 30) (%)	47 (37.3)	6 (20.7)	0.0891*
Pulmonary (%)	13 (10.3)	4 (13.8)	0.5266*
Diabetes (%)	10 (7.9)	5 (13.8)	0.2993*
Hypothyroid (%)	8 (6.4)	4 (13.8)	0.2394*
Other Hernia (%)	2 (1.6)	2 (6.9)	0.1592*

*Not statistically significant.

pulmonary embolism that was treated medically with anticoagulants. The most common complication was post-operative seroma formation (11% in group A, and 13% in group B). In most cases, these seromas were transient and resolved with conservative management; a few cases did require aspiration.

With a mean follow-up of 8 months (range, 1 to 52), 4 cases of recurrence were noted, 3 occurred in the younger group and only one in the older group. Two of these cases (one of each group) were attributed to morbid obesity along with the lack of adequate transfascial sutures. One case of recurrence was secondary to persistent seroma,

and one case was secondary to mesh infection that mandated mesh removal (**Table 4**).

DISCUSSION

Ventral hernias are a common problem seen in the elderly population. In the United States, complications related to hernias are one of the most common causes of emergency surgery in patients above 50 years old.¹² Ventral hernias are the second most common cause of intestinal obstruction, representing 10% to 15% of cases.¹³ The geriatric population is more prone to develop electrolyte and acid

Table 4.
Complications in Both Age Groups

Complication	≤65 Years Old	>65 Years Old	P Value
Conversion (%)	3 (2.4)	1 (3.5)	0.5673*
Seroma (%)	14 (11.1)	4 (13.8)	0.7480*
Recurrence (%)	3 (1.6)	1 (3.5)	0.5673*
Wound infection (%)	1 (0.8)	0 (0)	NA†
Mesh infection (%)	1 (0.8)	0 (0)	NA†
Prolonged Ileus (%)	6 (4.8)	0 (0)	NA†

*Not statistically significant.

†NA = Not available.

base imbalances from intestinal obstruction. The management of these complications is significantly more difficult in elderly patients with relatively high morbidity and mortality.¹⁴

During the early days of laparoscopic surgery, there were some concerns about the safety of this approach. Advanced age was considered a contraindication to laparoscopy. The rationale was that older patients have depressed myocardial¹⁵ and pulmonary functions¹⁶ that could be further compromised by a pneumoperitoneum. Furthermore, laparoscopic procedures used to require significantly longer operative times when compared with open procedures, thus exposing the patients to the risks of prolonged anesthesia.¹⁷

However, with the increased experience of laparoscopy these concerns have proven to be inaccurate. The adverse effects of a pneumoperitoneum can be reduced by keeping the pressure below 12mm Hg, which allows adequate distension of the abdomen with minimal effects on cardiac and pulmonary function.¹⁸ In addition, the advances in both surgical techniques and available laparoscopic tools have reduced the operative time of most laparoscopic procedures to levels comparable to those of open procedures. Furthermore, the safety profile of the currently available anesthetics is better than the earlier predecessors,¹⁷ which allows safe laparoscopy even in patients with comorbid conditions like liver cirrhosis.¹⁹ This has encouraged surgeons to perform more surgeries through the laparoscopic approach, especially when dealing with the elderly population.^{9,20,21}

Laparoscopic ventral hernia repair has proven to be a safe and effective alternative to the open approach.^{4,10,11} The recurrence rate following laparoscopic ventral hernia repair is reported to be 4.3%,¹¹ compared with the recur-

rence rate of 41% to 52% after suture repair, and 12% to 32% recurrence for open mesh repair.^{5,11,22} In addition, the patient gets to avoid the large abdominal incisions with the resultant pain, limitation of activity, and the inflammatory, hormonal, and metabolic stress of surgery.²³

Chronological age rarely correlates with a patient's general condition.¹⁷ Recent health care advances have allowed patients to live longer and maintain a higher level of activity even through advanced age, making them both more tolerant to surgery and more liable to hernia complication.

Although the risks of open ventral hernia repair may exceed those of untreated ventral hernias, the risks associated with laparoscopy are significantly lower. Based on this experience, the benefit of avoiding severe, life-threatening complications, such as incarceration and strangulation, exceed those of elective repair of ventral hernias through the laparoscopic approach in addition to the improvement in the quality of life of these patients.

CONCLUSION

This report demonstrates the feasibility, adequacy, and efficacy of laparoscopic ventral hernia repair in the elderly population. The decision to perform or not to perform an elective hernia repair should depend on the patient's condition and comorbidities regardless of the chronological age of the patient.

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